of tail-feathers must be considered to be that normal in the present family, twelve being that universal, with a few isolated exceptions, in all other Passeres.

In all other points, *Xenicus* and *Acanthisitta* conform to the general Passerine type. There is no trace of a plantar *vinculum*. The *tensor patagii brevis* has the peculiar arrangement characterizing the Passeres, only slightly masked by the muscular fibres somewhat concealing the two superimposed tendons, as is frequently the case in the short-and-rounded-winged forms of the group. The *gluteus primus* is well-developed. The tongue is lanceolate and horny, with its apex somewhat frayed out and its base spiny. The main artery of the leg is the sciatic. The sternum has a single pair of posterior notches and a bifid manubrium. In the skull the nostrils are holorhinal, the vomer broad and deeply emarginate anteriorly, the maxillo-palatines slender and recurved.

As regards the affinities of the Xenicidæ, the "haploophone" form of their syrinx, combined with the complete loss of a vinculum, shows that it is only with the Pipridæ (including the Cotingidæ), Tyrannidæ, Pittidæ, and Philepittidæ that they can be compared. From all of these they differ markedly, however, in the number of rectrices, the ocreate tarsus, and the nature of the syrinx, the latter never having the form of a complete bony box, and never lacking a bronchial "intrinsic" muscle in any of the families just enumerated. The Pittidæ they approach somewhat in their general *facies*, short tail, and long tarsus, though the tarsal scutellation is different in the two forms.

The Pittidæ are also, it is interesting to note, the only other family of Mesomyodian Passeres that enters the Australian region, though they have not extended their range to New Zealand. I know at present of no other Australian Passerines that can be considered allied to the Xenicidæ; nor are there apparently any other forms than the two here described present in New Zealand itself, *Certhiparus* and *Miro* both being, as well as *Clitonyx*[1], Oscines of the normal type.

4. On *Trichina spiralis*. By Prof. Owen, C.B., F.R.S., F.G.S., &c.

[Received June 10, 1882.]

The admission, kindly accorded by the Publication Committee, of my paper on *Trichina spiralis* (1835) to the first volume of the 'Transactions of the Zoological Society of London,' leads me to submit a few observations on subsequent references that have appeared in print on the subject of that paper. The general impression so produced is indicated by the following definition by the late lamented "Académicien," Littré, in his admirable 'Dictionnaire de la Langue française:'—"Trichine, s. f. Nom générique d'un helminthe nématoïde, le *Trichina spiralis*, découverte par Hilton et décrit par R. Owen."

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[1] *Vide anteà*, p. 544.

Among the notices of the discovery of the microscopic parasite prior to the date of that 'Dictionnaire,' I may limit myself to the following:—"It was first described, I believe, by Mr. Hilton of Guy's Hospital, and afterwards more fully by Professor Owen in 1835"[1].

The translation of that estimable work probably led to an opinion common among French practitioners, and which amply justifies the definition of "Trichine" given by their great lexicographer.

Reference to a number of an English weekly periodical for grounds of priority could hardly be expected in a foreign country; and our own accomplished physician, burthened with an extensive practice and professional duties, may well be excused for taking on trust current statements on so minute a matter.

It may not be unacceptable, or uninstructive to our younger fellow-workers with the microscope, to recall the honest devotion of his time and means of observation which the alleged discoverer gave to the subject of his paper entitled:—"Notes of a peculiar Appearance observed in Human Muscle, probably depending upon the formation of very small *Cysticerci*," by John Hilton, Demonstrator of Anatomy at Guy's Hospital"[2].

After noting that the "body for dissection was a male, aged 70," the author proceeds:—"The subject was prepared for injection, and subjected to a temperature of about 100° Fahr. On proceeding to the dissection, our attention was arrested by a mottled appearance of the pectoral muscles; and the same phenomenon presented itself in all the voluntary and respiratory muscles, to which, however, it was confined. The muscles were pale, soft, and not so distinctly fibrous as usual; between the fibres, and having their long axis parallel to them, there are situate several oval bodies, transparent in the middle and opaque at either end, altogether about $\frac{1}{23}$ of an inch in length. *No organization could be discovered with the aid of a microscope.* A small portion of the muscle, impregnated with them, was inserted under the skin of a rabbit on the back. This was done in three cases; but all the animals died within seventy-two hours, and without any appearance of the bodies in question being revivified."

Portions of the muscles of the same subject were taken by an accomplished physician of the Hospital, Dr. Addison, F.R.S., who, in an endeavour to promote some development of the supposed *Cysticerci*, "placed a portion of muscle in a glass tightly covered with paper, perforated by pin-holes; it was slightly moistened occasionally with water." On referring to it "casually" some weeks after, "a number of small flies were seen in the glass, apparently differing from the common house-fly, and some bodies were observed in the muscle, larger than those originally placed in the glass; from some of these an embryo fly was liberated"[3].

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[1] Lectures on the Practice of Physic, by (now Sir) Thomas Watson, M.D., 8vo, 1845, vol. iii. p. 492.

[2] London Medical Gazette, February 2, 1833, p. 605.

[3] London Medical Gazette, loc. cit. p. 606.

Thus it is plain that, of the two accomplished officers of the great Hospital and Medical School of Guy's, the Prosector or Anatomical Demonstrator came to the conclusion that the corpuscles in question were a minute species of Hydatid or *Cysticercus* ; and the Physician inclined to the belief that they were ova of a new species of Dipterous insect ; but Dr. Addison candidly owns "an unwillingness to draw an absolute inference from his experiment." The contents of the cyst were neither seen nor suspected by either observer.

Such was the state of knowledge when, early in February 1835, I received from Mr. Wormald, Demonstrator of Anatomy at St. Bartholomew's Hospital, in which Medical School I then held the office of 'Lecturer on Comparative Anatomy and Physiology,' portions of the muscular tissue of a subject to which his attention had been called on account of a gritty sensation perceived in dissection, and which, from the rapid blunting of the scalpels employed, he considered to be caused by deposition of specks of earthy matter.

This was the sole indication which reached me when I made the microscopical investigation, resulting in the discovery of the worm, as detailed in my 'Memoir' communicated to the Zoological Society of London, February 24th, 1835.

In the course of the investigation I inferred that the cysts containing the worm defined as "*Trichina spiralis*" were the corpuscles previously described by Hilton as "*Cysticerci*." At p. 321 of my 'Memoir' I give the facts and inferences which led me to reject the conclusion that the cyst was a kind of Hydatid or *Cysticercus*, and state "that the 'cyst' is adventitious, foreign to the *Entozoon*, and composed of the cellular substance of the muscles infested, morbidly altered by the irritation of the worm"[1].

At the time of this discovery I was unaware of the fact, subsequently noticed in my paper, that Mr. (now Sir James) Paget had taken portions of the affected muscles to the British Museum, where they were microscopically examined in the Botanical Department, and the wormlet in the cyst clearly seen.

Subsequently to the publication of 'Watson's Lectures,' which gave rise to other expressions of opinion besides Littré's, it was announced that both Hilton's and my observations had been anticipated by an eminent Professor of Physiology of Heidelberg. In the issue of the 'Times' newspaper of February 10th, 1866, insertion is given to the following 'Note' from "T. S. Cobbold, M.D., F.R.S., of No. 84 Wimpole Street:"—"Sir, If Mr. Jabez Hogg is in error respecting the discovery of *Trichina,* so also is the Curator of Guy's Museum. The 'little bodies' were first noticed by Tiedemann, in the year 1822, thus anticipating Mr. Peacock by six years."

No reference to the work or publication containing the record of Tiedemann's alleged discovery was given ; and the only account which could have suggested or served as a basis of the letter to 'The Times,' I found in the following German periodical—Froriep's 'Notizen,' Band i. S. 64 (1821). It appears as a record of a pathological appearance observed by the eminent Professor of Physiology in the University of Heidelberg at that date, and runs as follows:—"Prof. Tiedemann has found in the body of a man who was excessively addicted to drinking brandy, and who died from dropsy after several violent attacks of gout, white, stony concrements in most of the muscles, especially at the extremities. They were imbedded in the cellular tissue between the muscular fasciculi, frequently also attached to the membranes of the arteries. They were from 2 to 4 lines long and roundish in shape. Subjected to chemical analysis by Professor Gmelin, they were found to consist of:—

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[1] Zool. Trans. loc. cit. p. 322.

"Phosphate of Lime................	73
Carbonate of Lime	7
Animal matter, like albumen or fibrine,	20
	100."

The pathognomic inference was that these calcareous particles indicated a diffused form of arthritic deposit.

The acceptable fact is the analysis of the salts, which are attracted by the adventitious cysts after their lengthened retention in the muscular tissue, giving rise to the physical condition noticed in the dissection of the subject in St. Bartholomew's Hospital.

The foregoing details, chiefly of personal interest, I should not have intruded on the notice of the Zoological Society, save for the great and unexpected importance of the minute parasite which has become notorious since it first came into scientific existence in the pages of our publications. A brief record of this development of *Trichina*, the last that is likely to come from my pen on the subject, may, perhaps, be condoned.

I would premise, however, that, soon after the discovery of the wormlet, my friend Dr. Arthur Farre, F.R.S., added interesting facts to its anatomy from microscopic observations of the *Trichina* in its larval and encysted condition[1]. The German comparative anatomists Luschka[2] and Leuckart[3] have made known and admirably illustrated the anatomy of the species in its mature and procreative state.

Where and how is *Trichina spiralis* to be met with mature? Certainly not in the muscular tissue of mankind: all the examples there found have the generative organs undeveloped, as represented in plate xli. of the Trans. Zool. Soc., loc. cit.

Mr. Bowman, F.R.S., was, I believe, the first to notice the presence of vermicules, which he referred to *Trichina*, in the sarcolemma of the muscles of an eel[4]. *Trichinæ* have been subsequently detected in the voluntary muscles of the hedgehog, badger, cat, dog, but most frequently and abundantly in those of the hog. In 1852

[1] London Medical Gazette, December 1835.

[2] Siebold and Kölliker's Zeitschrift, vol. iii. 1851.

[3] Ibid. vol. iv. 1852.

[4] Art. MUSCLE in the 'Cyclopædia of Anatomy,' and Transactions of the Royal Society for the year 1840.

Herbst gave to dogs portions of the trichinosed flesh of a badger. Some months after, the dogs were killed; and numerous encysted larval *Trichinæ* were found in their muscular tissue [1].

In many villages and other localities in Germany the inhabitants had been afflicted by diseases, varying in their symptoms from those of dysentery and pneumonia to those of acute rheumatism, the discovery of the cause of which is due to Dr. Zencker. At his hospital at Dresden was admitted a young woman, who, after a month's suffering under these symptoms, died. None of the accepted remedial measures for such seeming diseases availed. On a *post mortem* examination her muscles were found to be infested by numerous *Trichinæ*; but these were uncysted: similar vermicules were discovered in the intestinal mucus; but these differed in having the genital tubes developed, in which were embryo *Trichinæ*. It was found that the patient had eaten, shortly before the illness, pork sausages. Some of the same sausages having been obtained, Zencker detected therein numerous encysted *Trichinæ*.

Experiments, suggested by this case, were repeated by Leuckart and Virchow, the occasions being, unhappily, too frequent and numerous in Germany; and the cases of a supposed epidemic which had ravaged certain localities were determined, mainly by such vivisectional experiments as Zencker's, to be, one and all, due to eating the flesh of trichinosed pigs in an uncooked or imperfectly cooked state.

For the symptoms by which the malady now known as *Trichinosis* simulates several well-defined diseases from other causes, I may refer to my paper "On the Scientific Status of Medicine," read at the International Medical Congress held in London, 3rd August, 1881 [2].

Living larvæ of *Trichina*, introduced into the human stomach, there and in the intestinal tract rapidly acquire maturity, develop their generative organs and products; and, being viviparous, the larvæ, in vast numbers, perforate the intestinal tunics, gain admission to the capillaries, are carried by the veins to the right half of the heart, are diffused through the lungs, are returned to the left cavities of the heart, are distributed by the arteries to the rest of the body, but, by a peculiar organic attraction, make their escape from the vascular system and settle in the muscular tissue, within the sarcolemma; and there they grow and cause such changes in the plasma effused by their irritation, as to enclose themselves, usually in a few coils, in the elliptic cysts which at one stage of condensation have been taken for hydatids, and at a later stage, through accumulation of earthy particles, for diffused gouty deposits.

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[1] Annales des Sciences Naturelles (Zoologie), 1852.

[2] Transactions of the Congress, vol. iii. p. 440.